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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,536	01/16/2004	Mikel J. Stanich	YOR920030609US1	6210

48150 7590 02/20/2007	EXAMINER	
MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC	KRASNIC, BERNARD	
8321 OLD COURTHOUSE ROAD		
SUITE 200	ART UNIT	PAPER NUMBER
VIENNA, VA 22182-3817	2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/758,536	STANICH ET AL.
	Examiner	Art Unit	
	Bernard Krasnic	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-32_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _1-5 and 18-32_ is/are rejected.
7) ☒ Claim(s) _6-17_ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _1-16-2004 and 6-21-2004_.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1.   Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2.   The abstract of the disclosure is objected to because it should be limited to a single paragraph with several sentences within the range of 50 to 150 words in length.

Correction is required. See MPEP § 608.01(b).

3.   The disclosure is objected to because of the following informalities:

Page 9, lines 9-10: "DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS" should be -- DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS --.

Page 14, line 20: "invetnion" should be -- invention --.

Appropriate correction is required.

Claim Objections

4.   Claims 26, 28-30 are objected to because of the following informalities:

Claim 26, line 1: "the image comprises" should be -- the image from the two

images comprises --.

Claim 28, line 4: "embed the image into the two images" should be -- embed the

multi-bit image into the two multi-bit images --.

Claim 29, line 5: "embed the image into the two images" should be -- embed an

image into two images --.

Claim 30, lines 4-5: "the Cartesian product" should be -- a Cartesian product --.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

5.   Claims 23 and 29 are rejected under 35 U.S.C. 101 because the claimed

invention is directed to non-statutory subject matter. Claims 23 and 29 are drawn to

functional descriptive material NOT claimed as residing on a computer readable

medium.   MPEP 2106.IV.B.1(a) (Functional Descriptive Material) states:

> "Data structures not claimed as embodied in a computer-readable medium are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer."

> "Such claimed data structures do not define any structural or functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized."

Claim 23, while defining a "integrating computer-readable code into a computing

system", does not define a "computer-readable medium" and is thus non-statutory for

that reasons. A "integrating computer-readable code into a computing system" can

range from paper on which the program is written, to a program simply contemplated

and memorized by a person. The examiner suggests amending the claim to embody

the program on "computer-readable medium" in order to make the claim statutory.

Claim 29, while defining a "signal-bearing medium tangibly embodying a

program", does not define a "computer-readable medium" and is thus non-statutory for

that reasons. A "signal-bearing medium tangibly embodying a program" can range from

paper on which the program is written, to a program simply contemplated and

memorized by a person. The examiner suggests amending the claim to embody the

program on "computer-readable medium" in order to make the claim statutory. Also, the

"signal-bearing media" includes "transmission media such as digital and analog and

communication links and wireless" as stated in page 30, lines 7-8 of the specification,

which is improper.

"In contrast, a claimed computer-readable medium encoded with the data structure defines structural and

functional interrelationships between the data structure and the computer software and hardware

components which permit the data structure's functionality to be realized, and is thus statutory." - MPEP

2106.IV.B.1(a)

Claim Rejections - 35 USC § 112

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

7.   Claims 13-14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

Re Claim 13: The limitations "p1, p2, p3", "S", and "M" render this claim indefinite

because it is unclear what these parameters define. It is suggested to define these

parameters in the manner that parameters "si" and "di" are defined in lines 5-6 of this

claim.

Claim 14 is dependent upon claim 13.

Re Claim 16: The limitations "s1, s2, s3", "di", "a1, a2, a3", "S", and "M" render this claim

indefinite because it is unclear what these parameters define. It is suggested to define

these parameters in the manner that parameter "H" is defined in line 4 of this claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.   Claims 24 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Fu

("Data Hiding in Halftone Images by Stocahastic Error Diffusion" – IEEE – May 2001,

vol 3, pages 1965-1968).

Re Claim 24: Fu discloses extracting an image / overlaying from two images,

comprising extracting the image / overlaying from the two images using a binary

operation / overlaying on each pair of pixels from the two images (see abstract, when

two images are overlaid it is the same as basically a binary AND operator).

Re Claim 25: Fu further discloses extracting the image from the two images comprises

extracting the image from more than two images (see Section 1 – Introduction,

paragraph 4, lines 1-4, embed into two or more images and therefore instead of

overlaying two images together to show the embedded feature, more than two images

are needed to be overlaid to show the embedded feature).

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11.   Claims 1-4,18-23, 26-31 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wu (US 2002/0171853 A1) in view of Fu.

Re Claims 1, 18, 28, 29 and 31 respectively: Wu discloses a method or system of

embedding an image or a muti-bit image / one or more images into two images or two

multi-bit images / source image (see paragraph [0086], one or more images may be

embedded into the source image, paragraph [0020], Wu's images are in the color space

and color is represented in multi-bits or d-bytes, the image input device is ref. 714 or

716 in Fig. 7), comprising performing a digital halftoning process (711) on a Cartesian

product of color spaces / Cartesian product of several color spaces to embed the image

/ one or more images into the two images / source image (see Fig. 7, paragraph [0017],

paragraph [0018], lines 1-4, paragraph [0132], the halftoning device is the processor,

paragraph [0135] discloses the signal-bearing media as understood).

Re Claim 27: Wu discloses a method of embedding a color image / one or more images

with color spaces into two color images / source image with color space (see paragraph

[0018], lines 1-4) comprising decomposing color images into separate images in their

color planes / separate into color spaces (see paragraph [0020]); for each color plane /

color space, performing a digital halftoning process on a Cartesian product of pixel

value spaces / Cartesian product of color spaces to embed the image / one or more

images into the two images / source image (paragraph [0017], paragraph [0018], lines

1-4); and combining the halftone images of the color planes into a single color image

(see paragraphs [0018] and [0020], the combination is just a result from the

decomposing or the separating).

As to claim 30, it differs from claim 1 in that claim 1 is a method claim whereas

claim 30 is a system claim with "means" for performing the method. Therefore, all the

limitations in claim 30 are respectively analyzed and taught by Wu in the same manner

Wu taught the limitations in claim 1 above.

The limitations as recited in claim 30 in lines 2 and 4, "means for providing" and

"means for performing" invoke 35 USC 112, 6th paragraph.

However, Wu fails to disclose or fairly suggest that the source image is two

images for claims 1, and 27-31. Also, Wu fails to disclose or fairly suggest the source

image is embedded into more than said two images.

Fu discloses embedding one image into two images (see abstract, hides or

embeds data in two images).

Fu, as recited in claim 19, discloses the image is embedded into more than said

two images (see Section 1 – Introduction, paragraph 4, lines 1-4, embed into two or

more images).

Therefore, in view of Fu, it would have been obvious to one of ordinary skill in the

art at the time the invention was made to modify Wu's method and system by including

the specified suggestion that Wu's source image may be more than one image (two

images or more) in order to improve the extractor by giving it the means to overlay two or more embedded images and produce the hidden or embedded data (Fu, abstract).

Re Claim 2: Wu further discloses the digital halftoning process comprises a vector error diffusion method (see paragraph [0076], the vector error diffusion described by Haneishi).

Re Claim 3: Wu further discloses the digital halftoning process comprises a modified error diffusion method (see paragraph [0082], the modified error diffusion is Adler's error diffusion).

Re Claim 4: Wu further discloses the digital halftoning process comprises an iterative isotropic halftoning process (see Fig. 5A, paragraph [0107], line 5, paragraphs [0111] and [0112]).

Re Claim 21: Wu further discloses said images comprise black and white images / K component (see paragraphs [0019] and [0020], the K component is the black and white image if the separation is done on the CMYK instead of the RGB).

As to claim 20, the discussions are addressed with respect to claims 1 and 28.

As to claim 22, the discussions are addressed with respect to claims 1 and 28.

As to claim 23 as understood, it differs from claim 1 in that claim 1 is a method claim whereas claim 23 is a computer-readable medium encoded with computer-readable code. Therefore, all the limitations in claim 23 are respectively analyzed and taught by Wu in the same manner Wu taught the limitations in claim 1 above (Wu, paragraph [0131]).

Although Wu as modified by Fu doesn't specifically discloses, as recited in claim 26, extracting the image comprises extracting more than one image from the two images, it would be obvious to one of ordinary skill in the art at the time the invention was made to have such a feature because Wu discloses embedding more than one image (Wu, paragraph [0086]) into two images (Fu, abstract) and therefore this embedding method has the capability to extract more than one image from two images by just doing the reverse operations.

12.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13.   Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu as

modified by Fu (2001), and further in view of Fu ("A novel self-conjugate halftone image

watermarking technique" – IEEE – May 2003, pages 790-793). The teachings of Wu as

modified by Fu (2001) is discussed above.

However, Wu as modified by Fu (2001) fails to disclose or fairly suggest one of

the two images is a rotated version of the other of the two images.

Fu (2003) discloses one of the two images is a rotated version of the other of the

two images (see Figs. 5-8, abstract).

Therefore, in view of Fu (2003), it would have been obvious to one of ordinary

skill in the art at the time the invention was made to further modify Wu's method and

system, as modified by Fu (2001) by including one of the two images is a rotated

version in order to improve the extractor by giving it the means to overlay two

embedded images and produce the hidden or embedded data (Fu 2003, abstract).

14.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

15.   Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu as

modified by Fu (2001) and further in view of Adler ("Error bounds for error diffusion and

other mathematical problems arising in digital halftoning" – SPIE – January 2000, pages

437-443). The teachings of Wu as modified by Fu (2001) are disclosed above.

However, Wu as modified by Fu (2001) fails to disclose or fairly suggest a gamut

mapping device performs gamut mapping on the image received by the image input

device.

Adler discloses a gamut mapping device which performs gamut mapping on the

image received by the image input device (see page 442, Section – 4.1 Constrained

Error Diffusion, lines 9-13).

Therefore, in view of Adler, it would have been obvious to one of ordinary skill in

the art at the time the invention was made to further modify Wu's system, as modified

by Fu (2001) by including the gamut mapping unit to Wu's error diffusion in order for

Wu's error diffusion not to diverge as a result to a this modification to error (Adler, page

442, Section – 4.1 Constrained Error Diffusion, lines 12-13).

Allowable Subject Matter

16.   Claim 6 is objected to as being dependent upon a rejected base claim, but would

be allowable if rewritten in independent form including all of the limitations of the base

claim and any intervening claims.

Claims 7-17 depend from claims 6, therefore, are objected.

Conclusion

17.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wong discloses a system and method for displaying a color image using vector error diffusion; Bunce discloses a partial pixel encoding and decoding method; Knox discloses a digital watermarking using stochastic screen patterns; Wang discloses a digital watermarking using conjugate halftone screens; Waldron discloses an error diffusion in color printing where an intra-gamut colorant is available; Shaked et al discloses an apparatus and method of performing dithering in a simplex in color space; Lin discloses a complementary halftone screens for highlight printing; Klassen discloses an error diffusion on moderate numbers of output colors; Velde et al discloses an adequate quantization in multilevel halftoning; Adler et al discloses a constrained digital halftoning; Steinhauer discloses an expanded color space; Wu discloses a digital watermarking and steganography via overlays of halftone images.

18.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357. The examiner can normally be reached on Mon-Thur 8:00am-3:00pm and every other Friday 8:00am-3:00pm.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bernard Krasnic
February 12, 2007

JINGGE WU
SUPERVISORY PATENT EXAMINER